

REMARKS

In the present Amendment, Claims 1, 11 and 14 have been amended to incorporate therein the subject matter of Claims 3, 16 and 22, respectively, and to recite “an enzyme exhibiting a deodorizing effect when water-soluble lignin is present.” Section 112 support for this amendment may be found, for example, at page 8, lines 10-13 of the specification. In addition, Claims 1 and 14 have been amended to delete “a fragrance and/or flavor.” Claims 2-3, 12, 15-18 and 21-22 have been cancelled without prejudice or disclaimer. Claims 5-9 have been amended to depend only from Claim 1. No new matter has been added, and entry of the Amendment is respectfully requested.

Upon entry of the Amendment, Claims 1, 5-9, 11 and 14 will be pending.

In paragraph No. 4 of the Action, Claims 1-3, 5-9, 11, 12, 14-18, 21 and 22 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Echigo et al (US 6,537,546) in view of Yamashita et al (US 6,780,403).

Applicants submit that this rejection should be withdrawn because Echigo et al and Yamashita et al do not disclose or render obvious the presently claimed invention, either alone or in combination.

In order to demonstrate the composition being used as a deodorant in Echigo et al is different from the presently claimed deodorant composition and the patentability of the present invention over Echigo et al in view of Yamashita et al, Applicants submit herewith a Declaration under 37 C.F.R. § 1.132 executed by Mr. Tadahiro Hiramoto, a co-inventor of the present invention.

In his Declaration, Mr. Hiramoto explained the mechanisms of eliminating or relieving odors of Echigo et al and that of the present invention as follows, and presented additional experimental data.

Echigo et al relates to an effective producing method for polymerizing phenolic compounds by acting an enzyme having a polyphenol oxidizing activity on phenolic compounds (lignin or lignin derivative), and deodorants and smell eliminators comprising the resulting polymer compounds are disclosed. See, col. 3, lines 10-15 and 54, and abstract. However, the effects of deodorants and smell eliminators are not disclosed.

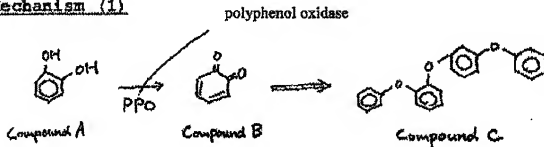
With regard to the mechanism of polymeric reaction of Echigo et al, the following method was disclosed in "BACKGROUND ART" of Echigo et al.

In the polymeric reaction in which polyphenolic compounds are polymerized by an autooxidation of the polyphenolic compounds, phenolic compounds are effectively polymerized by the polymeric reaction in the alkaline pH region, since an optimal reaction pH region of the enzyme which functions as the catalyst is alkaline region.

That is, the phenolic compounds are reacted with each other to be polymerized.

The mechanism of eliminating or relieving odors of Echigo et al is shown below.

Mechanism (1)

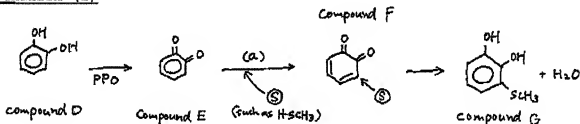


In Echigo et al, the polymerized composition (Compound C) itself has an effect of eliminating or relieving odors. Therefore, the composition of Echigo et al is a **polymer composition**. However, the mechanism of eliminating or relieving odors of Compound C is not known.

In contrast, in the mechanism of eliminating or relieving odors of the present invention, a water-soluble lignin can be changed to a quinone structure by coexisting enzymes, and the quinone structure is reacted with odorant to eliminate or relieve the odors. See page 19, lines 12 to 18 of the specification. That is, the water-soluble lignin is reacted with the odorants.

The mechanism of eliminating or relieving odors of the present invention is shown below.

Mechanism (2)



In the present invention, eliminating or relieving odors mainly occurs in the process of the above reaction (a). The mechanism is that Compound E is rapidly reacted with odors such as H-SCH₃ before polymerizing. Therefore, the composition of the present invention is **low molecular composition** (Compound G).

As is shown from the above explanations, the mechanisms of eliminating or relieving odors between Echigo et al and the present invention are considerably different. Therefore, the formed compositions are also considerably different in that the composition of Echigo et al is polymer composition and the composition of the present invention is low molecular composition.

Additional experimentation was performed according to Example 19 at pages 35-37 of the specification. The experiment performed was one in which "sodium lignosulfonate" was used as a substitute for "calcium lignosulfonate" to prepare a product of the present invention. It is known that sodium lignosulfonate and calcium lignosulfonate are low molecular compositions.

In Comparative Example 2, "1 mL of a 1% reaction mixture solution of sodium lignosulfonate and polyphenol oxidase + 1 mL of water" was used. The reaction mixture of sodium lignosulfonate and laccase is prepared according to column 12, line 61 to column 13, line 8 of Echigo et al, other than that a commercially available polyphenol oxidase as a polyphenol oxidase in an activity concentration of 1,800 U/liter is used. It should be noted that it is obvious to one skilled in the art that laccase is one of polyphenol oxidase. The product prepared by Comparative Example 2 is a polymer composition and corresponds to that of Echigo et al.

As seen from the table on the last page of the Declaration, Examples 1 and 2 were prepared from calcium lignosulfonate and sodium lignosulfonate, respectively, with an enzyme exhibiting a deodorizing effect when water-soluble lignin was present, and the ratio of eliminating odors was 100%.

In contrast, the ratio of eliminating odors in Comparative Example 2 (that of Echigo et al, using the polymerizing product) was 0%.

Accordingly, the present invention provides unexpectedly superior results and is patentable over Echigo et al in view of Yamashita et al.

Further, synergistic effects of the combined use of lignin and an enzyme exhibiting a deodorizing effect when water-soluble lignin is present are apparent from Examples 1 to 38 of the specification. Furthermore, the presently claimed deodorant composition has an effect of removing the bad odor emitted by lower fatty acids such as butyric acid and isobutyric acid (see,

page 4, lines 5-9 of the specification), compared with the known compositions (see, page 3, lines 8-12 of the specification). Still further, the presently claimed deodorant composition has an additional effect of giving off little or no foul odor derived from the substrate (see, page 8, lines 1 to 8 of the specification).

These unexpected results are not taught or suggested by Echigo et al. Yamashita et al is relied upon as teaching adding a perfume in a deodorant composition. Therefore, Yamashita et al does not make up for the deficiencies of Echigo et al.

In view of the above, reconsideration and withdrawal of the § 103(a) rejection based on Echigo et al in view of Yamashita et al are respectfully requested.

In paragraph No. 6 of the Action, Claims 1-3, 5-9, 11, 12, 14-18, 21 and 22 have been provisionally rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 1, 20, 23, 34, 41, 44 and 45 of co-pending Application No. 10/410,520.

Since this double patenting rejection is provisional, Applicants would like to defer responding at the present time.

Allowance is respectfully requested. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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